PROJECT NUMBER: 1750
PROJECT TITLE : Pyrolysis and Combustion of Tobacco
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PERIOD COVERED: August, 1984

I. FT-IR-EGA STUDIES

A. Tobacco Seeds

Five varieties of tobacco seeds have been examined to determine whether FT-IR-EGA could discriminate between tobacco materials at this stage. From the preliminary results, some small differences were noted for all types examined. Seedlings soon after germination will also be examined as part of an effort to explore FT-IR-EGA as an early diagnostic tool.

B. Glucosylamine and Rhamnosylamine

EGA profiles of these materials are quite similar with the principal exception of a presently unknown component that evolves from the rhamnosylamine. This component appears to derive from the rhamnose sugar and additional analyses to define it will be performed.

C. Supercritical CO_2 Extracted Tobacco Material

For inclusion in our base collection of profiles for tobacco materials, uncased bright, burley and oriental tobaccos which had been extracted with supercritical CO_2 were examined. The principal features observed for bright tobacco were reductions in sugars and nicotine. Using evolutions in the higher carbohydrate regions (which presumably would not be significantly affected by the treatment), the weight loss due to the extraction process was estimated at 8%.

II. METHODS DEVELOPMENT

A. Spectromicroscopy

An analytical technique that may overcome a long held contention that one cannot resolve spectral features below the diffraction limit of the radiation involved has been proposed. The technique would utilize modulated radiation and synchronous detection of modulated components in an electron microscope signal channel. The requirements and alternate mechanisms for testing this technique are being examined.

B. Hardware/Software Development

1. Revisions to some of our software routines on both the Digilab FTS-20E minicomputer system and the DEC 2060 system were made to allow better manipulation and plotting of spectra using the DEC 2060.

2. The pressure formatter system was received, but a problem with the file size and communications system must be resolved before this system will be operational.

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3. A special thanks is extended to Brian Jeltema for developing a better communications software system between our Digilab FTS-20E spectrometer and the DEC 2060. This system improves both the speed and reliability of communications between these machines.

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